NOTES ON SOME WASPS AND BEES (HYMENOPTERA) OF POONA AND THE WESTERN GHATS

BY

F. L. WAIN, S.S.J.E.

(With a plate and 21 figures)

The following notes are based on a somewhat desultory collection made during the past five years. The nomenclature is that of Fauna of British India series (Bingham).

Wasps can roughly be distinguished from Bees, as being less hairy and not having the broad dilated joint on the hind legs which bees use for carrying pollen. Wasps are carnivorous in the larval stage, whereas bee grubs feed on honey and pollen. In the adult stage both Wasps and Bees are vegetarian. Both groups contain social and solitary forms.

WASPS

Wasps are divided into two main groups, the Hunting or Digging Wasps (Fossores) and the True Wasps (Diploptera). The latter fold the wings lengthways in two when at rest.

FOSSORES

The females of these wasps hunt for prey of various kinds on which to lay their eggs. The prey is stored up in various ways, usually alive but paralysed by being stung, to ensure the grub shall have fresh meat for its food and not be poisoned by eating decayed food.

Family MUTILLIDAE

The females are without wings, and at first glance look something like ants ; but they move much more quickly. They are said to lay their eggs on the larvae of various kinds of bees.

Mutilla argenteomaculata ♀. About three quarters of an inch long, with six silver spots on the black abdomen. (Khandala).

Mutilla pulchiventris ?♀. Less than half an inch, with five silver spots. (Poona).

Mutilla valida ♀. Same size as above with four spots. (Lonavla).

Mutilla nobilis ♀ (Fig. 1). Head and thorax red, abdomen with golden spots. (Lonavla).

Mutilla emeryi ?♂. Orange red abdomen. (Matheran. Lonavla).

Family Scoliidae

These are usually heavily built hairy wasps. They make no nest, but the female burrows in the earth to find beetle larvae, on which the

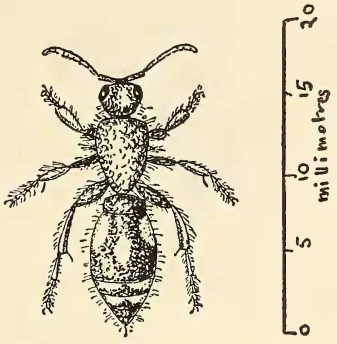


Fig. 1. *Mutilla nobilis* ♀

eggs are laid. They can sometimes be seen entering heaps of decaying leaves in search of the large fat white beetle grubs. These wasps are often found at flowers.

Scolia bilunata. Black, with four yellow spots on sides of the abdomen. The male is slighter with three spines on end segment. (Poona).

Scolia quadripustulata (Fig. 2). Black with red spots or band on the abdomen. A very common species. (Poona. Khandala).

Fig. 2. *Scolia quadripustulata* ♂

Scolia aureipennis. Entirely black, with a coppery sheen on the wings. Tips of the antennae red. (Poona).

Scolia histrionica. Strikingly coloured in red and yellow, with some black markings. (Poona).

Elis thoracica (Fig. 3). Black, with thick whitish hair on the thorax. I have seen this wasp burrowing in loose earth, but when I dug out the earth only two crickets were found. I could not find any beetle larvae. (Poona. Khandala).

Elis annulata ♂. I have only found males. Smallish, black with yellow bands. (Poona. Matheran. Lonavla).

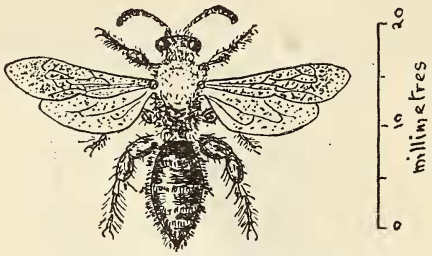


Fig. 3. *Elis thoracica* ♀

Elis asiatica ? A large entirely black wasp. (Poona).

Liacos analis. Black, with most of abdomen bright red. (Matheran).

Family Pompilidae

These wasps have very long legs; the abdomen is never on a long thin stalk, as in many of the Sphegids; the eyes are not kidney-shaped.

This group contains wasps of very varying size. Most store the prey in holes or crevices in walls or trees, or in the ground, though a few make little mud cells. The prey consists of spiders, crickets or grasshoppers.

Pseudagenia blanda (Fig. 4). This genus makes little earthen cells in which the prey (spiders) is stored. This wasp is about half an inch long, bright metallic blue. (Bombay).

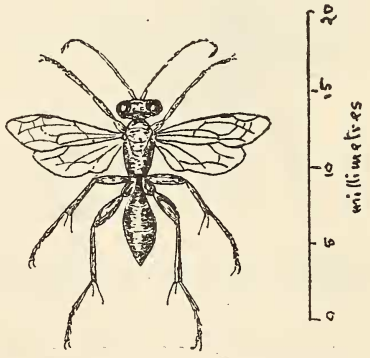


Fig. 4. *Pseudagenia blanda* ♀

Pseudagenia tincta. A small black wasp. (Poona).

Pseudagenia micromegala ? Another smaller black wasp, with two dark bands in the clear wings. (Poona).

Pompilus fenestratus. This genus preys on spiders and stores them in some nearby hole in the earth or crevice, blocking up the entrance afterwards with a small stone or earth. This species is very small, black with red abdomen. (Poona).

Pompilus mitis. Similar to the above, but larger. (Poona).

Salius aureosericeus. *Salius* contains some of the largest species of wasp. They prey on various kinds of Orthoptera. This species is a large insect, with a wing-spread of two and a half inches. It is black, with head and fore part of the thorax covered with golden hairs. The wings are deep yellow. It may have been this wasp (unless it was *Sphex luteipennis*) which I saw flying with a large green grasshopper held in its legs. It dropped the grasshopper and flew off before I could see it properly. (Matheran).

Salius fulvipennis. Similar to the above but smaller. Often seen in light forest. (Lonavla).

Salius flavus (Fig. 5). Rather smaller than *Salius fulvipennis*, with the feet black. (Poona. Khandala).

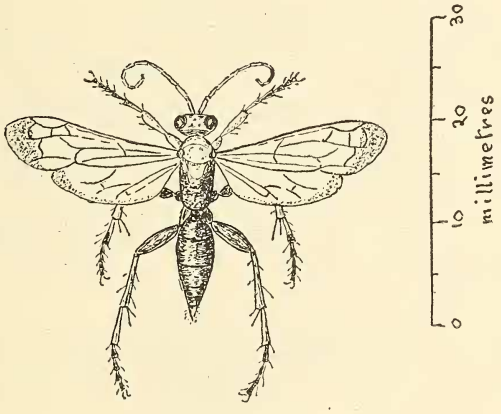


Fig. 5. *Salius flavus* ♀

Salius consanguineus. Black, with orange legs and dark purplish brown wings. (Matheran. Lonavla).

Salius madraspatanus (Fig. 6). A large wasp, velvety black all over, with dark brown wings, having a purple sheen. I saw this wasp as it captured a grasshopper about its own size. The wasp stood over its prey and stung it carefully on the underside of the thorax. The grasshopper was then quite paralysed. After cleaning itself up, the *Salius* took the prey in its mouth and dragged it along between its legs. It flew only occasionally in short flights of a few inches. The grasshopper was pulled up the trunk of a Banyan tree to the wasp's nest in a crevice in the trunk, quite high up. (Lonavla, Matheran).

Family Sphegidae

This is rather a heterogeneous group. They are distinguished by the first thoracic segment, which is short, like a kind of collar round the

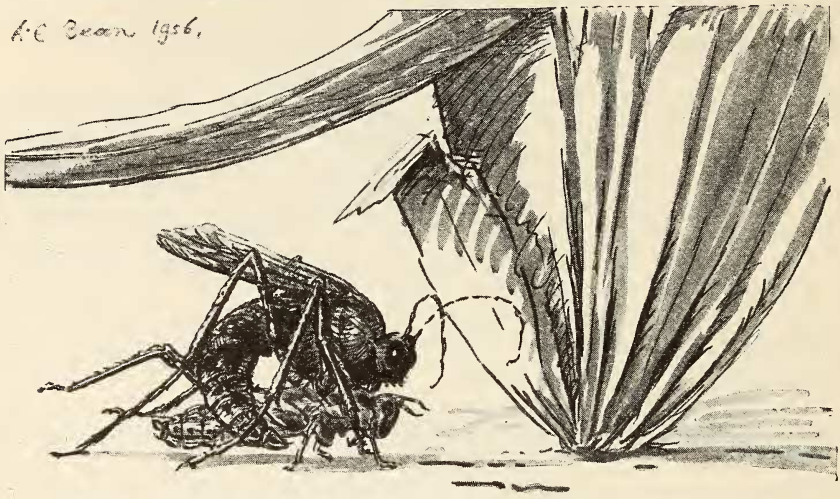


Fig. 6. *Salius madraspatanus* about to sting a grasshopper nymph.

neck, and which does not reach back to the base of the wings as in all other wasps.

Tachytes modesta. Black with lines of silvery pile on the abdomen. The legs reddish. *Tachytes* makes holes in the ground for nests and stores Orthoptera for the grub to feed on. (Poona).

Tachytes nitidula. Similar, but with legs black. (Khandala).

Notogonia subtessellata. A small black wasp, which also nests in the ground and preys on crickets. (Poona).

Liris aurata (Fig. 7). A beautiful little wasp, the golden pile on the head and prothorax being quite conspicuous. I have noted these wasps

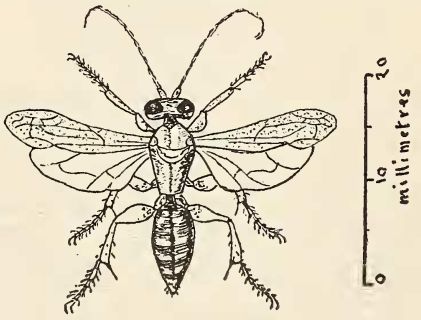


Fig. 7. *Liris aurata* ♀

occupying a hole in a wall at nights for several nights in succession. It preys on crickets and stores them in nests underground. (Poona).

Pison argentatum. A very small black insect, less than half an inch long. I think this is the wasp which builds small elliptical mud nests, many together, often in houses in the corners of ceilings and walls. (Poona).

Trypoxylon intrudens (Fig. 8). This also comes frequently into the house. It has a very long narrow tapering abdomen, reddish with black

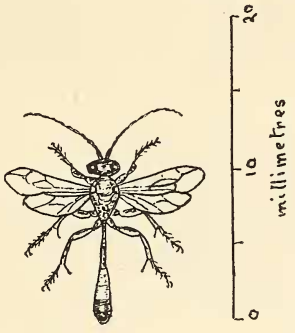


Fig. 8. *Trypoxylon intrudens* ♀

apex, which makes it fairly easy to identify at once. These wasps build mud nests, which I have always found singly, on walls of houses, indoors. They are oblong, and rough outside. They are stored with paralysed spiders for the grub. (Poona).

Trypoxylon bicolor. Similar to the above but larger.

Ammophila laevigata (Fig. 9). Another wasp with a very long petiole to the abdomen. At first glance it resembles *Trypoxylon bicolor*, but can

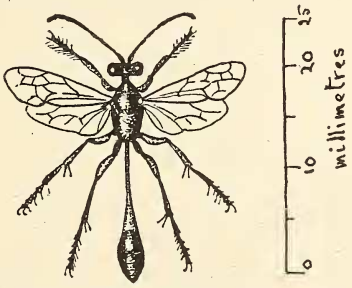


Fig. 9. *Ammophila laevigata* ♀

be distinguished by the two apical spurs on the intermediate tibiae and the more complicated venation of the forewings. *Trypoxylon* has only one tibial spur and a comparatively simple venation. *Ammophila* nests in the ground and stores carterpillars or spiders. A nest of *Ammophila laevigata* I found was dug vertically in level fairly hard ground. I saw the wasp just as it had brought a green caterpillar, which lay rigid and paralysed some three inches from the nest hole. The wasp went down the hole two or three times, and

then, seizing the caterpillar by the head in its jaws, dragged it down the hole, the wasp going backwards. It then came up and proceeded to close up the hole. First a large flat stone was put over the mouth of the nest, then smaller ones, and finally dust swept over. The ground was made quite level and small stones and pieces of grass arranged over the top, so that no sign of the hole remained. (Poona. Lonavla).

Sceliphron madraspatanum (Fig. 10). Another wasp with a very long thin petiole to the abdomen. It is strikingly coloured in black with

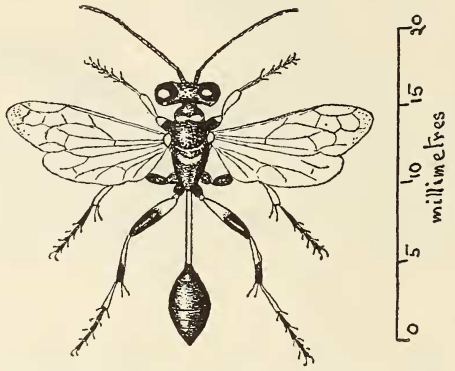


Fig. 10. *Sceliphron madraspatanum* ♂

yellow petiole and legs. *Sceliphron* makes cylindrical mud cells and stores them with spiders. A nest examined contained twenty three spiders. (Poona. Lonavla).

Sceliphron coromandelicum. Distinguished from the above by having the posterior legs yellow, without any black marks on them. I have noticed some of these wasps congregating together in the evenings on some branch or leaf, for several nights in succession. (Poona).

Sceliphron violaceum. Dark shining metallic blue all over. This species seems often to build the mud cell in a hole. I once saw one use the ventilation hole of a sola topi. It first widened the hole, bringing out bits of pith by the front legs. The nest was stored with spiders, carried by the front legs only, except one large one, for which the wasp used the front and intermediate legs. This large spider was carefully stung before being pushed into the nest. Five or six spiders were put in. The nest was then closed with mud, the pellets being carried in the mandibles. At first it was worked smooth, but the finishing coat was put on roughly and allowed to remain so. The whole process took two days, during which the removal of the topi at intervals did not seem to upset the wasp at all. (Poona. Matheran. Lonavla).

Sphex lobatus. All species of *Sphex* make nests in the ground and store them with various kinds of Orthoptera. This species is a large wasp, nearly one and a quarter inches long, brilliant metallic blue-green all

over, with yellowish wings. In hunting for crickets, this wasp digs in loose earth like a dog, using the front and intermediate legs, and sending a spray of earth out behind. Large stones and sticks it removes in its mouth, walking backwards as it removes them. (Poona. Lonavla).

Sphex splendidus. About the same size as the above. The head, thorax and legs are brick red and the abdomen metallic purple. I have not noticed this wasp digging for prey, and it probably attacks grasshoppers. It frequents hard, stony, dry ground. (Lonavla. Sinhagad).

Sphex luteipennis. A very large black wasp with yellow wings. This may have been the insect I saw flying with the large green grasshopper, if it was not *Salius*. But I have seen it stated that *Sphex* always drags its prey along the ground. (Matheran).

Sphex umbrosus. Smaller: black with whitish pubescence on thorax. Wings transparent and colourless. (Poona).

Sphex aurulentus (Fig. 11). Reddish, with apex of abdomen black. A common species. (Poona. Matheran. Lonavla).

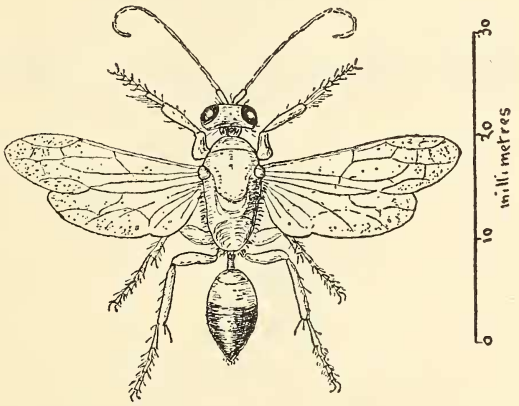


Fig. 11. *Sphex aurulentus* ♀

Sphex vicinus ? Smaller: black variegated with dull red. Also very common. (Matheran. Lonavla. Poona).

Ampulex compressa (Fig. 12). Shining metallic blue-green, with posterior legs red. It is characterised by a very long narrow pro-thorax. It preys on cockroaches and often enters houses in search of them. I have seen this insect with a cockroach it had just captured. It soon flew off however, perhaps as I was standing too near. The cockroach gradually recovered from its paralysis and after about fifteen minutes walked away. *Ampulex* stores its prey in a hole or crevice, blocking up the entrance. (Poona).

Trirhogma caerulea. Dark metallic blue, about half an inch long. Uncommon. (Poona).

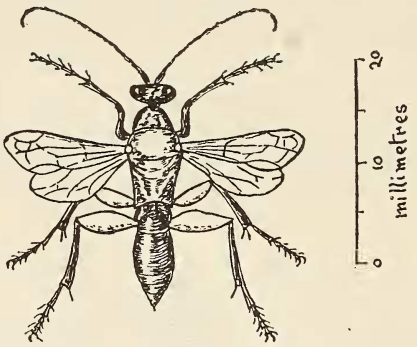


Fig. 12. *Ampulex compressa* ♀

Stigmus niger. A minute black wasp, less than one quarter of an inch long, with conspicuous stigma in the wing. It is often seen on the window pane in houses. (Poona).

Stizus blandinus. A rather heavily built wasp, black, with abdomen light brick red. In Europe a *Stizus* preys on frog-hoppers. (Poona).

Bembex trepanda (Fig. 13). Variegated yellow and black. *Bembex* is partially social, many individuals making their nest burrows in the

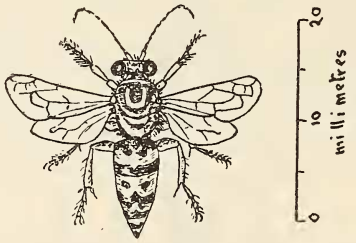


Fig. 13. *Bembex trepanda* ♀

same patch of sandy soil. It preys on flies, and is unusual in that the prey is killed, not paralysed. The nest is only temporarily closed and the mother wasp brings more flies for the growing grub as it needs them. The characteristic of this genus is the long prominent labrum, or upper lip. (Poona. Lonavla).

Philanthus basalis. Small black wasps with yellow bands on the abdomen. The legs are reddish. Often found at flowers. They nest in holes in the ground, closing the entrance with loose earth. I have seen a small Chrysid wasp enter a nest, so presumably it parasitises the *Philanthus*. (Poona. Sinhagad. Lonavla).

Cerceris humbertiana ? A tiny wasp, black with yellowish markings, and the first segment of the abdomen red. The characteristic of this

genus is the strongly constricted segments of the abdomen, as if tight threads had been tied round at intervals. *Cerceris* is said to prey on beetles. (Lonavla).

Oxybelus agilis. Another tiny wasp, with some whitish markings. (Poona).

Diploptera

Family Eumenidae

The True Wasps are divided into Eumenidae and Vespidae. The only constant feature which distinguishes them, is that the former have only one apical spur on the intermediate tibia, the latter have two. Eumenids are solitary wasps ; Vespids are social.

Eumenes petiolata (Fig. 14). A large red wasp, with long narrow petiole to the abdomen, which is yellow, with a black band. All this genus

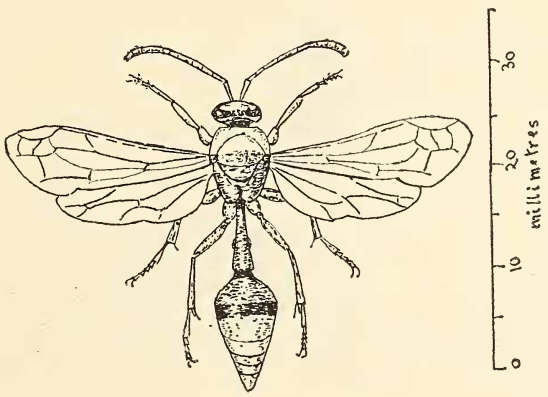


Fig. 14. *Eumenes petiolata* ♀

make beautiful little clay nests, shaped like an earthenware ' chatti ', complete with rim. They store them with caterpillars, closing the cell and usually plastering the whole over roughly with mud, so that the ' chatti ' is no longer seen. (Poona).

Eumenes affinissima. Small and black with a few yellow markings. All *Eumenes* have the long narrow petiole. (Poona).

Eumenes esuriens. Like *Eumenes petiolata*, but half the size. (Poona).

Eumenes conica. Large, red, with black markings. This wasp often enters houses in order to build its nest. It is frequently parasitised by a Chrysid wasp, *Stilbum cyanurum*, bright metallic green which may often be seen in the house searching for *Eumenes'* nests. (Poona).

Eumenes flavopicta. Large, with very long thin petiole; yellow and black bands. (Matheran. Sinhagad. Lonavla).

Rhynchium brunneum. *Rhynchium* differs from *Eumenes* in not having the long petiole. This species is dull red with black markings. It often enters houses in order to make its nest in some hole in the furniture. It lines the hole and closes it with mud. It stores caterpillars, which I have seen it bring to the nest flying, held under the body by the six legs. (Poona).

Rhynchium metallicum. Jet black all over. (Poona).

Rhynchium nitidulum. Only to be distinguished from the above by the curious projections from the sides of thorax. (Poona).

Odynerus ovalis (Fig. 15). A small black and yellow wasp with no petiole. It makes its nests in the perpendicular banks of streams or

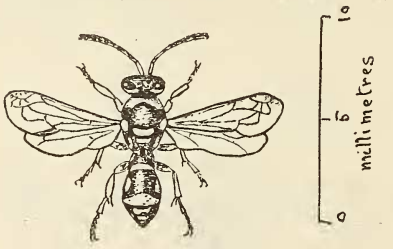


Fig. 15. *Odynerus ovalis* ♀

ponds. The nest is at the end of a short tunnel, at the entrance to which it constructs a fragile earthen tube, hanging downwards. I have seen it stated that these bent tubes discourage parasites from entering. *Odynerus* stores caterpillars for the grub. (Poona. Lonavla).

Odynerus miniatus. A tiny wasp, smaller than the above. (Poona).

Family Vespidae

These are the True Social Wasps.

Icaria marginata. Very common. A small red wasp. They make the nest of 5–40 cells, of wasp-paper. The cells all open downwards and are attached by a strong 'stalk' to the underside of leaves, branches etc. They often build in houses. A distinguishing character of *Icaria* is the very retractile end segments of the body, which are usually folded into the large bell-shaped second segment in telescope fashion.

Icaria ferruginea (Fig. 16). Larger than the above, red with broad yellow band on abdomen. (Poona. Purandhar).

Icaria variegata. A common tiny red wasp with yellow and black markings. (Poona. Lonavla).

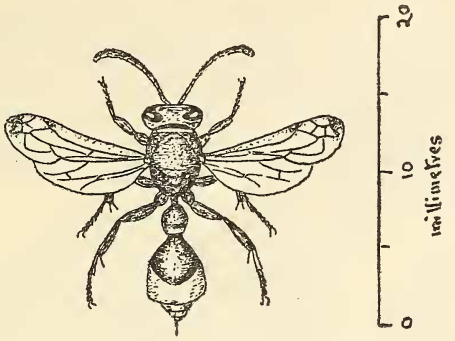


Fig. 16. *Icaria ferruginea* ♀

Polistes stigma. *Folistes* has no petiole as *Icaria* has. (Poona. Lonavla).

Polistes hebraeus (Fig. 17). Large yellowish, with some black markings. (Poona).

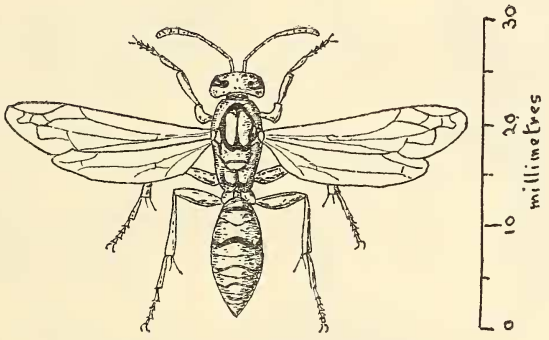


Fig. 17. *Polistes hebraeus* ♀

Vespa cincta. A large wasp with conspicuous yellow band round the abdomen. The sting is said to be dangerous. (Poona. Lonavla).

BEES

Nomia westwoodii. A small black bee, one-third of an inch long with greenish yellow bands on the abdomen. A solitary bee, nesting in tunnels in the ground. (Purandhar).

Megachile disjuncta. *Megachile* comprises the Leaf-cutter bees. They line their nests with pieces of leaf which they cut in the following way. The bee sits on the edge of a leaf, the legs holding it on either side. It then begins to cut in a semicircle towards its tail.

As the cutting goes on the piece of leaf is rolled up between the legs. As the last cut is made, it flies off with the cut piece rolled up between its legs. They nest in holes, often in houses; some make mud cells. I found one nest, put among the roots of a fern, made entirely of rose petals. The nest is filled with honey and pollen for the larva. *Megachile disjuncta* is black with a conspicuous yellow band round the waist. (Poona).

Megachile lanata (Fig. 18). Bright rusty red hair on the head, thorax and top of abdomen. The rest of the abdomen with thin white

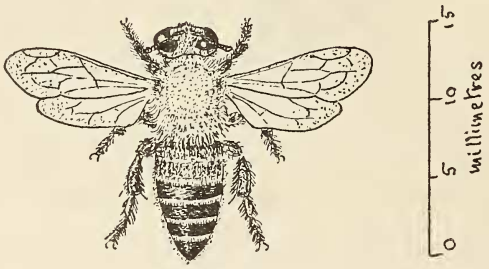


Fig. 18. *Megachile lanata* ♀

bands. A common species, which often enters houses to nest. It makes mud cells. (Poona. Lonavla. Sinhagad).

Megachile cephalotes. A small black bee, with thin whitish bands on the abdomen. (Poona).

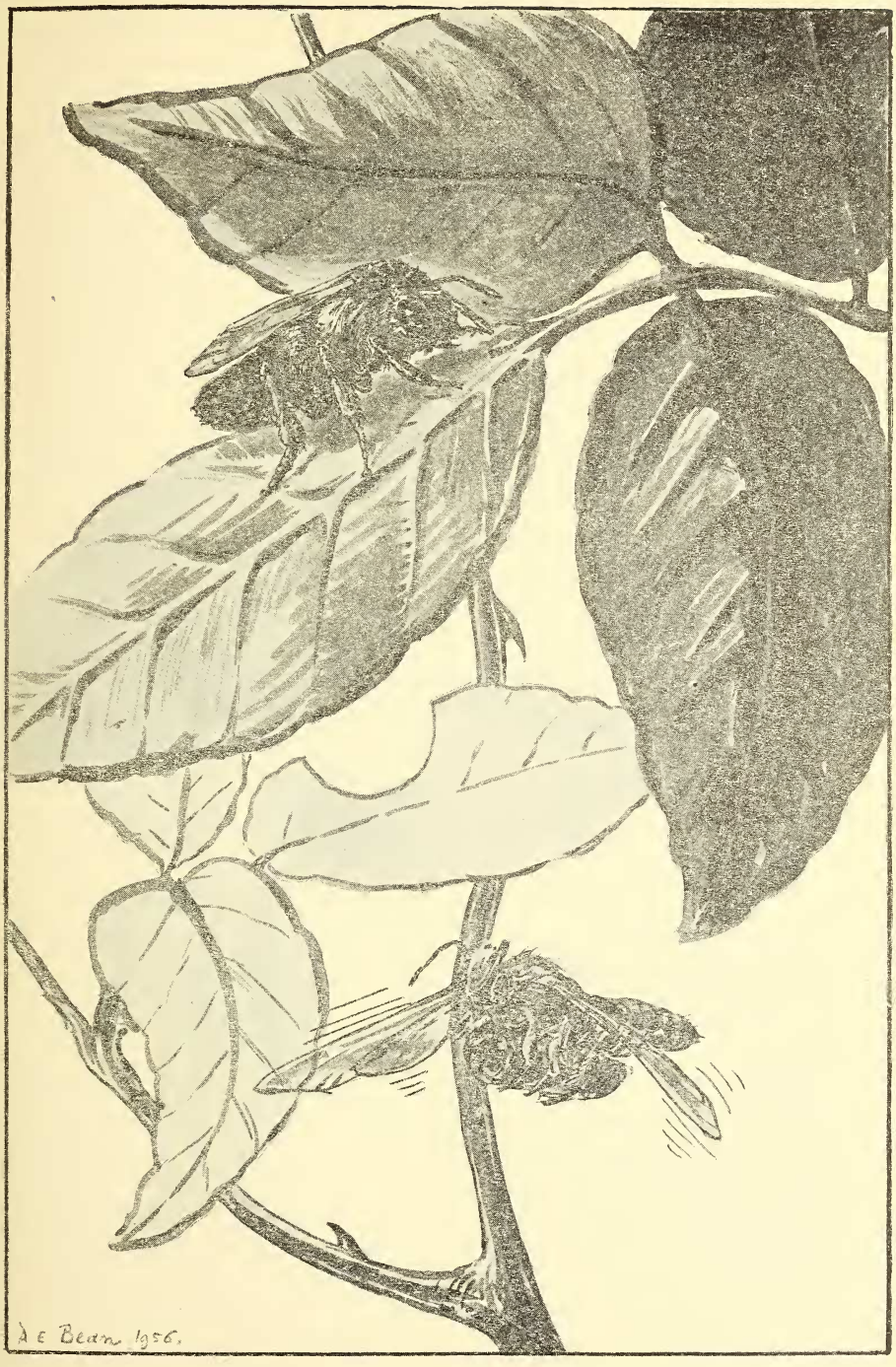
Megachile albifrons. Black, with snow white pubescence on head, sides of thorax and bands on the abdomen. (Sinhagad).

Parevaspis carbonaria. A black rather hairless bee with darkish wings. It is parasitic on *Megachile.* (Poona).

Ceratina viridissima. A tiny bright metallic green or blue bee. Common at flowers. They are said to nest in hollow stems. (Poona. Sinhagad. Lonavla).

Coelioxys decipiens. Black, with white markings and bands on the abdomen. The abdomen is rather long and, remarkably pointed, shaped somewhat like a carrot. These bees are parasitic upon *Megachile.* (Poona).

Crocisa emarginata. *Crocisa* is parasitic in the nests of *Anthophora* and can often be seen examining walls or banks for the nests. This species is black with markings and bands of a beautiful bright blue, varying in shade. (Poona. Matheran).



Leaf-cutter Bees *(Megachile disjuncta)* in action.